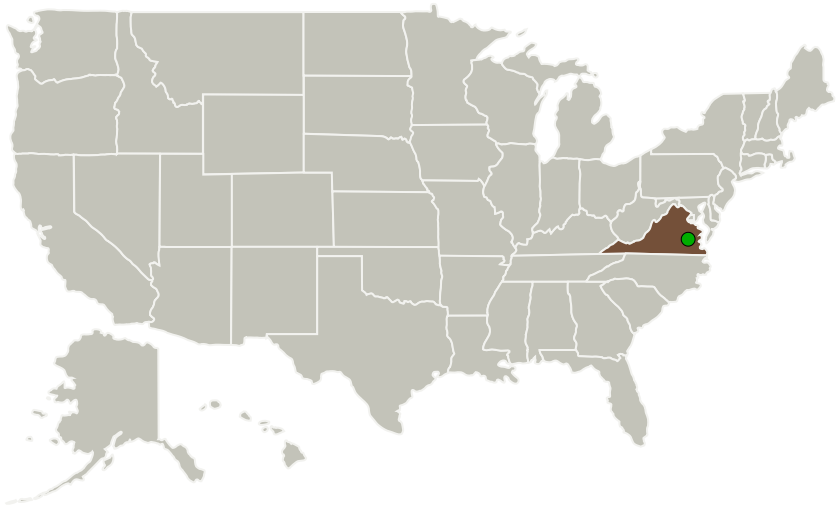
Fiber MOPA for Ascends, Phase II

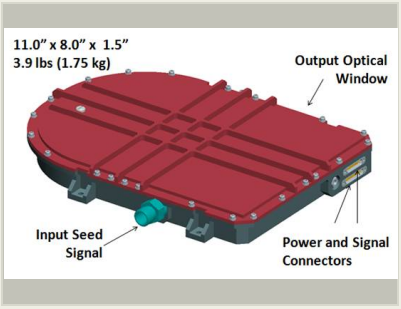
Completed Technology Project (2014 - 2016)

Project Introduction

CO2 sensing using absorption bands near 1570nm is very attractive by taking advantage of the mature fiber-amplifier technology derived from fiber-optic telecom heritage. This necessitates sufficient power scaling in 1.5 micrometer fiber-amplifiers, either in the pulsed-mode, or in the cw-mode for modulation spectroscopy. In this SBIR program we propose the design, optimization, experimental evaluation and prototype development of a high-power, high wall-plug efficiency, 1571 nm fiber-amplifier laser transmitter, compatible with multi-line cw intensity-modulated integrated-path differential absorption spectroscopy, with the size, weight and power (SWaP) optimized for airborne and directly supports and enables space-qualifiable roadmap for Earth Venture (2015) and ASCENDS missions. We leverage innovations in high-power 1.5 micrometer fiber-optic technology and fiber-amplifier architecture, while using high-reliability 1.5 micrometer silica-fiber based passive/active components. Our expectation is that at the end of Phase 2, a TRL-6 level hardware can be developed and delivered for an airborne mission, and which is also compatible with a space-flight maturation roadmap.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Fibertek, Inc.	Lead Organization	Industry	Herndon, Virginia
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations
Virginia

Project Transitions

May 2014: Project Start

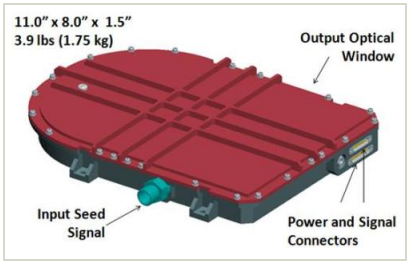
August 2016: Closed out

Closeout Summary: Fiber MOPA for Ascends, Phase II Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/137615)*

Images



Briefing Chart Image
Fiber MOPA for Ascends, Phase II *(https://techport.nasa.gov/image/134341)*

Final Summary Chart Image
Fiber MOPA for Ascends, Phase II Project Image *(https://techport.nasa.gov/image/134305)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Fibertek, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

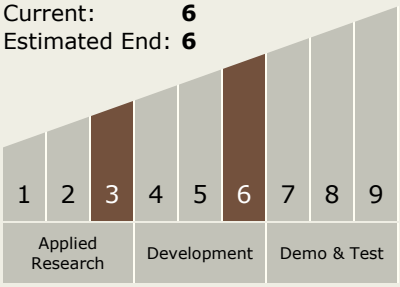
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Brian Mathason

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Fiber MOPA for Ascends, Phase II

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Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.5 Lasers

Target Destinations

Earth, The Moon, Others Inside the Solar System, Outside the Solar System, The Sun, Mars